AERIAL TANKER FORCE MODERNIZATION

The Congress of the United States

Congressional Budget Office

PREFACE

The Administration is proceeding with plans to expand and update the Air Force's fleet of tanker aircraft. By providing airborne refueling, tankers serve both to extend the flying ranges of bombers for strategic nuclear missions and also to assist other military aircraft in conventional non-nuclear contingencies. Thus, the extent of future need for tanker resources will depend not only on the number and type of bombers fielded over the next decade, but also on the demand for support of conventional non-nuclear missions. Requested by the Senate Committee on Armed Services, this study examines likely tanker needs over the next dozen years, especially in light of bomber force modernization plans; it also examines alternative approaches to meeting that demand. In accordance with CBO's mandate to provide objective and nonpartisan analysis, this paper offers no recommendations.

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SUMMARY

Last October, the Reagan Administration announced a plan to update U.S. strategic nuclear forces. A centerpiece of that program was a commitment to build two new strategic bombers over the next decade. The first, a modified form of the B-1 bomber (which had been cancelled by President Carter in 1977) would be fielded in 1986. The second, a new advanced technology bomber (ATB) incorporating "stealth" technologies, would be deployed in the early 1990s. The current fleet of B-52s now being converted to carry cruise missiles will eventually be retired or retained as standoff cruise missile carriers as the new bombers enter service.

Much public debate has focused on the bombers. As important as the bombers themselves, however, is the large fleet of tanker aircraft used to refuel bombers in flight. Bombers could not execute their missions without using tankers to extend their ranges. The bomber modernization program, and especially the plans to retire a major portion of B-52s, have tremendous implications for current tanker resources.

Tankers also now figure prominently in conventional nonnuclear war plans, and they could prove indispensible, for instance, in projecting the Rapid Deployment Force (RDF) to distant theaters of operation. The need for substantial tanker capacity emerged especially clearly during the Arab-Israeli war in 1973, when U.S. airlift missions in support of Israel were nearly halted for the lack of mid-course refueling.

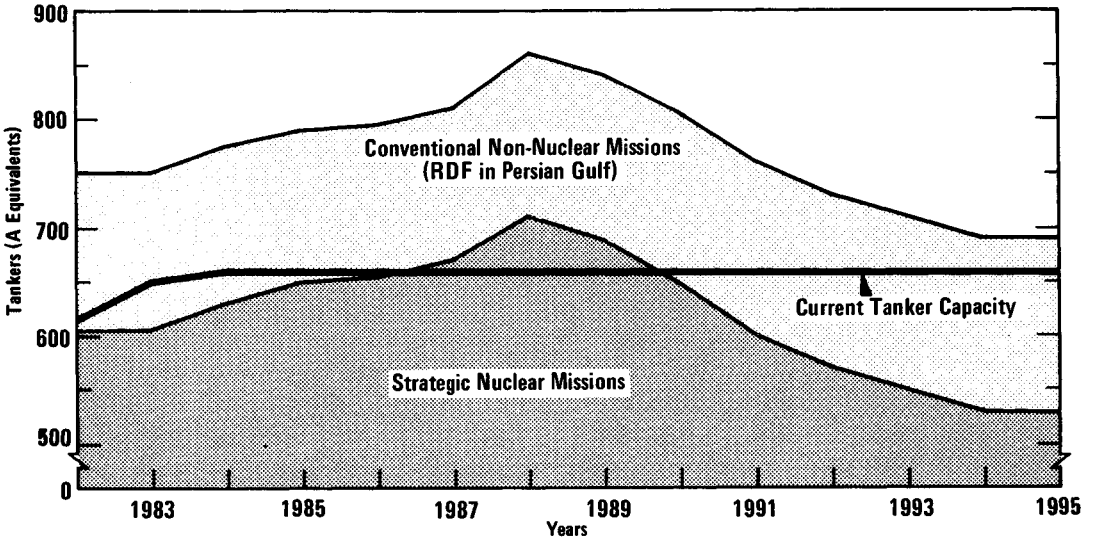
These two sets of developments--planned bomber development and the need not to rely on ground refueling--have led to efforts to expand U.S. tanker resources.

ESTIMATED FUTURE TANKER NEEDS

Through the 1980s, according to the Congressional Budget Office's analysis, tanker demand will substantially exceed current capacity, reaching a peak in the late 1980s, if no effort is made to increase tanker resources. In the longer term, however, after B-52 aircraft are retired from service and new bombers are fielded, tanker demand will not substantially exceed present

capacity, obviating the need for further tanker force expansion. (These trends are displayed in Summary Figure 1. This study estimates the number of tankers needed to support both strategic nuclear forces and conventional non-nuclear forces; requirements are expressed in terms of existing KC-135A tanker aircraft or their equivalents. The period studied by CBO extends from the present through fiscal year 1994.)

Summary Figure 1.
Projected U.S. Tanker Aircraft Demand for Strategic Nuclear and Conventional Non-Nuclear Missions, 1982-1995



SOURCE: Congressional Budget Office.

In recent years, the Congress has promoted the expansion of tanker resources. It must now confront the apparently contradictory issues of near-term shortages and potential longer-term excesses, since current Administration tanker initiatives will boost capacity well above projected demand. This study examines three alternative means the Congress might consider for increasing the Air Force's tanker fleet resources:

- o Installing new generation CFM-56 engines on existing KC-135 tanker aircraft (predecessors of the Boeing 707);
- o Installing older generation, though refurbished, JT3D engines on the KC-135s. (Those engines would be salvaged from commercial transports being retired from service);
- o Continuing to procure the advanced KC-10 tanker (a modified form of the commercial DC-10 transport).

This analysis indicates that the KC-10, while the most costly alternative on a per airplane basis, is the least expensive way to expand tanker resources, as is shown in Summary Table 1. The next most cost-effective choice is the use of older generation JT3D engines on current KC-135 tankers. The least cost-effective option is the re-engining program using modern CFM-56 engines.

SUMMARY TABLE 1. INVESTMENT COSTS OF ADDITIONAL TANKER EQUIVALENTS (Based on average improvement of tanker alternatives)

Option	Average Improvement (percent)	In millions of 1983 dollars: Average Investment Cost	In millions of 1983 dollars: Investment Cost per Tanker Equivalent
KC-135R Aircraft with CFM-56 Engine	43	20.0 a/	46.5
KC-135E Aircraft with JT3D Engine	19	7.2 a/	37.9
KC-10 Aircraft	276	70.0 b/	25.4

SOURCE: Congressional Budget Office.

a/ Includes funds to update selected aircraft subsystems.

b/ Includes some $4 million to adapt aircraft for nuclear missions.

Equally important, this analysis indicates that effects of the alternatives vary in timing. These two factors--varying costs and timing--distinguish these three approaches.

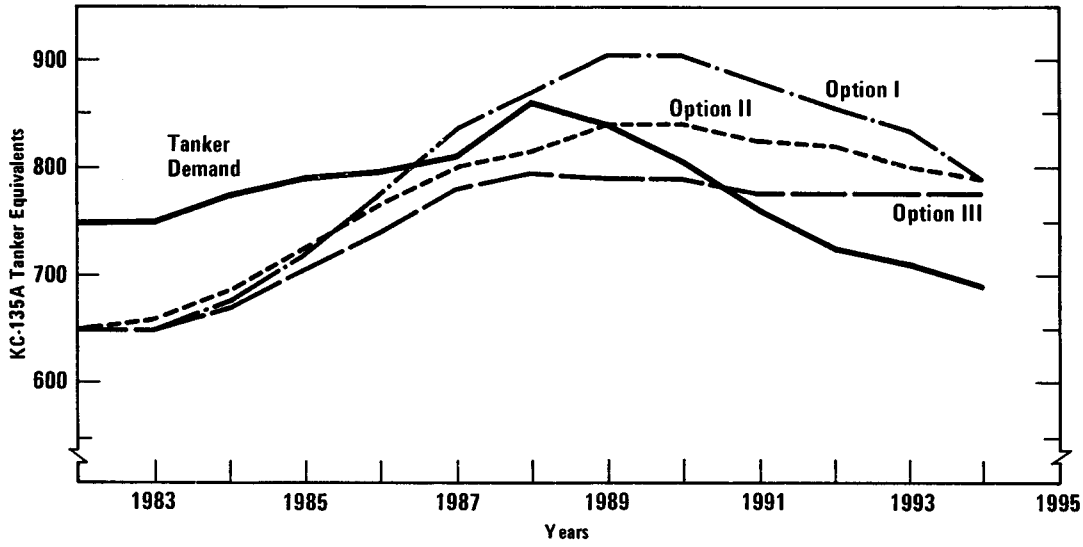
THREE STRATEGIES FOR TANKER MODERNIZATION

Option I. The Administration Program

Over the next five years, the Administration intends to re-engine approximately 300 tankers with CFM-56 engines. To improve airlift capabilities, it also proposes to buy an additional 44 of the new KC-10s. Since these transports are particularly useful as tankers, they are evaluated here for their contribution to meeting aerial refueling needs. These two undertakings are estimated to cost a total of approximately $8.5 billion over the next five years. (Unless otherwise specified, costs are expressed in fiscal year 1983 dollars.) The Administration's program would fall short of tanker requirements until 1987. From that point on, the Administration's alternative would provide substantial excess capacity, especially after tanker demand has peaked and begun to decline in the late 1980s (see Summary Figure 2).

Summary Figure 2.

Projected U.S. Tanker Aircraft Demand and Alternative Modernization Options, 1982-1995



SOURCE: Congressional Budget Office.

Option II. Match Performance of the Administration Program But at Less Cost

Of the two engines with which current tankers could be fitted, the JT3D engine is less capable than the CFM-56, but it is more cost effective. In an effort to economize within Defense Department accounts, the Congress could choose to refit 185 KC-135 tankers with the older generation JT3D engines instead of the costlier CFM-56s; the savings could be substantial. Re-engining more than 185 aircraft would not be necessary, since the additional re-engined tankers would not become available much before 1989, when demand is expected to fall; and anticipated capacity should prove sufficient. The exact number and timing of these modifications reflect the likely availability of retiring commercial Boeing 707 transports. (The program outlined here is an expanded version of one explored by the Air Force last year but dropped because of budgetary constraints. The Congress directed DoD to pursue this option in 1982. The Air Force plans to re-engine 28 KC-135s with JT3D engines, though it does not intend to continue the program after fiscal year 1982.)

This alternative would provide the capabilities of Option I through 1986; after that date, however, capabilities would diverge markedly (see Summary Figure 2). By 1989, tanker demand is projected to fall below the point at which either program would meet demand.

Choosing this alternative would cost about $3.8 billion, or some $4.7 billion less than the Administration program over the next five years. The option would achieve only about 40 percent as much noise reduction as would re-engining with CFM-56 engines, which is one important distinction. In other respects, though, this option would achieve much of the improvement in fleet capability at dramatically less cost than the Administration proposal.

Option III. Limit Tanker Modernization to KC-10 Procurement

The CBO has found that the KC-10 is the most cost-effective tanker alternative. As noted above, the Administration intends to purchase 44 KC-10s over the next five years, primarily as a cargo transport. Since the aircraft was sought initially as a tanker and would be bought with those features intact, it is evaluated here as a tanker aircraft. The Congress could choose to limit tanker modernization to the Administration's plans to buy additional KC-10 transports. Summary Table 2 shows a modernization

SUMMARY TABLE 2. UNIT PURCHASES AND PROGRAM COSTS FOR ALTERNATIVE MODERNIZATION PROGRAMS

Cost Component	Through 1982	1983	1984	1985	1986	1987	Total
Option I--The Administration Program							
Procure KC-10 Aircraft	18 a/	8	8	8	8	10	60
Refit KC-135 Aircraft with CFM-56 Engine	9	25	58	64	72	72	300
Cost (billions of 1983 dollars)		1.47	1.84	1.80	1.78	1.57	8.45
Option II--Lower Cost Modernization							
Procure KC-10 Aircraft	18 a/	8	8	8	8	10	60
Refit KC-135 Aircraft with JT3D Engine	28	48	48	48	13		185
Cost (billions of 1983 dollars)		1.18	0.85	0.80	0.53	0.41	3.77
Option III--Procure KC-10 Aircraft Only							
Procure KC-10 Aircraft	18 a/	12	12	12	6		60
Cost (billions of 1983 dollars)		1.13	0.76	0.65	0.27		2.81

SOURCE: Congressional Budget Office.

a/ Assumes the Congress endorses the Administration request for two KC-10s in the fiscal year 1982 supplemental appropriation.

program that would purchase those 44 KC-10 tankers, but at an accelerated pace, over the next four years.

This alternative would offer much of the performance of the previous two options but at dramatically less cost. The all-KC-10 alternative would meet between 85 and 95 percent of all requirements through 1989. Cancelling all further re-engining with either of these two engine choices would save nearly $5.7 billion over the next five years.

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CHAPTER I. A PERSPECTIVE ON THE TANKER AIRCRAFT PROGRAM

The U.S. Air Force maintains a large fleet of tanker aircraft that can refuel bombers and other military aircraft while airborne, thus extending their flying ranges and obviating the need for intermediate refueling bases. For several years, the Department of Defense (DoD) has sought to expand the capacity of the tanker fleet both by buying new advanced tankers and by improving the performance of existing aircraft. The justification for augmenting the tanker force depends not only on the number of aircraft in use that can be refueled while airborne, but also on fundamental decisions regarding the future of strategic bomber modernization plans. This study examines tanker modernization in light of the DoD's present and likely future demand for aerial refueling, specifically examining the effects of plans to modernize bomber aircraft. The paper offers answers to two questions:

- How much tanker capacity will be needed in the future?
- With different investment levels, what is the most effective mix of tanker alternatives for meeting anticipated demand?

EXPANDED REQUIREMENTS AND THE NEED FOR TANKER MODERNIZATION

The Air Force pioneered development of equipment and procedures by which one aircraft can transfer fuel to another while both are airborne. Tankers were conceived as a way to extend the flying range of bombers, permitting basing at secure rear bases or in the United States, rather than at vulnerable and expensive "forward staging areas." (These terms are explained in the Glossary at the end of this chapter.) The primary tanker--the KC-135A, which was the prototype of the commercial Boeing 707--is still in operation. The KC-135 tankers were introduced in 1957 and were intended to accompany the B-52 bombers then just entering service. Some 820 KC-135s were delivered, and some 640 are still dedicated to supporting B-52 and FB-111 bombers assigned to the Strategic Air Command (SAC). Despite the fact that a good many bombers have been retired over the last 20 years, SAC still needs large numbers of tankers. This is because the DoD's present war scenarios would require that SAC bombers fly for long distances

at low altitudes in enemy air space. These two factors--long distances and low-altitude operations (which dramatically increase fuel consumption)--point to a need for ample tanker support for SAC bombers.

In recent years, the Air Force has sought to expand tanker resources to meet demands greater than can be served by the existing fleet. Three factors have been cited to justify this expansion. First, the number of aircraft capable of in-flight refueling has increased markedly. In the late 1950s, only SAC bombers could refuel in the air. Today, however, aerial refueling plans figure prominently in support of conventional non-nuclear operations as well as strategic nuclear war plans. All Air Force aircraft now being produced (except trainers) can be refueled in flight, and several important types of older aircraft are being modified to add that feature.

The second justification derives from recent experience. The United States' participation in the 1973 Arab-Israeli conflict consisted of the use of transport aircraft to deliver emergency cargo to Israel. Fearing reprisals, most countries between the United States and the Middle East refused permission for U.S. military transports to land for refueling. Though Portugal ultimately gave permission to use Lajes Field in the Azore Islands for refueling, the general reluctance of most countries demonstrated the possibility that future airlift operations in politically sensitive situations might require substantial numbers of tankers to provide airborne refueling. Tankers used for that purpose would not be immediately available to support strategic bombers, though some could be redirected for that purpose in a matter of hours.

Plans to update the aging B-52s underlie the third justification. At present, bombers would, in the event of war, attack enemy targets with short-range weapons, on so-called "penetration" missions. Tanker requirements will temporarily increase because of the decision to modify B-52 bombers to carry cruise missiles. Current modification plans proceed in two phases. Cruise missiles will initially be installed on pylons under the wings. In this first phase, B-52s, after launching all 12 cruise missiles mounted on the pylons, would continue into enemy territory to attack other targets with short-range weapons. 1/ This so-called

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1/ Short-range weapons consist of nuclear gravity bombs as well as Short Range Attack Missiles (SRAMs).

"shoot-and-penetrate" flight plan increases fuel and tanker requirements, since the weight of the cruise missiles displaces fuel in order to stay within aircraft gross weight limitations at takeoff, while the cruise missiles themselves add to air resistance ("drag") during flight. In the second phase, when cruise missiles are installed in the bomb bays of the bombers, tanker requirements will decline substantially, since B-52 bombers will "stand off" only and not have to fly over enemy territory.

The Administration recently announced plans to update the strategic bomber force by building both a modified version of the B-1 bomber to carry cruise missiles and short-range weapons, and by proceeding with the new advanced technology bomber (ATB) incorporating so-called "stealth" technologies, which limit its susceptibility to detection by Soviet air defense radars. B-52 bombers will be converted into carriers of cruise missiles and later retired, when both the B-1 and the ATB are fielded. The bomber program, as is shown below, dramatically increases tanker requirements over the next five years. Longer-term tanker demand, on the other hand, may not justify so expansive a tanker modernization program. In other words, there is only an interim period during which the need for such a program is clear.

CONTENDING APPROACHES TO EXPAND TANKER RESOURCES

The Air Force has available three possible programs that would increase tanker capacity. Two involve efforts to improve the performance of existing KC-135 tankers. The third involves procurement of new tanker aircraft--the KC-10. Each option is discussed below.

Replacing Engines on Existing KC-135 Tankers

Re-Engining with the CFM-56. During the past five years, the Air Force has developed a program to replace existing engines on the present KC-135A tanker with a new generation of turbofan engines called the CFM-56. 2/ The greater power of the engines

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2/ The re-engining program parallels commercial proposals to the airlines to replace old engines on Boeing 707s and DC-8s. Most airlines found that savings from re-engining their early model 707s were not sufficient to justify the initial

increases the allowable takeoff weight and thereby the fuel payload, and the improved efficiency of the engines means they consume less of that payload for their own operation, thus leaving more fuel to be transferred to receiving aircraft. The re-engined KC-135 (designated the KC-135R) would also be substantially quieter and less affected by seasonal weather conditions than the existing KC-135A model. 3/ This program is the primary Administration alternative for meeting future tanker needs.

Re-Engining with Salvaged Commercial Engines. In 1981, the Air Force explored options to buy used Boeing 707s from several commercial airlines. The airlines are eager to sell the aircraft, because their engines will not meet more rigid noise and pollution standards that will be in force in 1985, effectively grounding the fleet. The Air Force intended to remove and refurbish the engines and related equipment on the 707s and install them on existing KC-135s. 4/ The salvaged and refurbished JT3D engines offer substantial improvement over existing KC-135 engines, though not so good as the CFM-56 noted above. Their principal asset is the speed with which they can be fielded and their low investment cost, estimated to be between 20 and 40 percent of the cost of re-engining with new generation CFM-56 engines. Last year, the Congress directed DoD to spend up to $85 million to develop this alternative. The Air Force initially

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investment in new engines. DC-8 aircraft, however, are being re-engined. General Electric and Snecma, a French firm, jointly produce the CFM-56.

3/ At present, the KC-135 cannot meet Federal Aviation Regulations on allowable noise and pollution emmission standards for commercial aircraft. Military aircraft are exempt from such regulations. However, Air Force Reserve units operating KC-135 tankers frequently are based near large metropolitan centers and have been the subject of local complaints. The Air Force Reserve has frequently testified in favor of re-engining, largely for the advantages it offers in avoiding local political pressure to restrict KC-135 operations.

4/ The refurbished engines would provide some 6,000 service hours of operation. At commercial airline tempo, that would be used up in less than three years. Military aircraft fly substantially fewer hours. At the current flying pace of 326 hours per year, the refurbished engines would last some 18 years.

objected, since the Congress instructed DoD to undertake JT3D re-engining with funds provided for CFM-56 re-engining. Air Force accounts were subsequently increased to permit funding of both programs. The Air Force has now made arrangements to re-engine 28 tankers with the JT3D engine in fiscal year 1982, though it plans no further use of this alternative.

Advanced Tanker/Cargo Aircraft

In the early 1970s, the Defense Department sought to expand its tanker fleet by taking advantage of the inherently greater efficiency of new generation wide-body commercial transports over the first generation jet aircraft like the KC-135. The Air Force selected McDonnell-Douglas' DC-10, designated for military use as the KC-10, as an advanced tanker. The improved range and payload of the KC-10 made it a particularly attractive prospect in the days after U.S. airlift operations in the Arab-Israeli war. In addition to its tanker functions, the KC-10 has substantial cargo capacity, and it can be used in conjunction with tanker operations. A KC-10 can not only ferry fighter planes to distant theaters; it can also transport initial issues of support equipment and personnel at the same time. Unlike previous tanker programs, the KC-10 was primarily justified for use in support of conventional general-purpose forces.

During the past year, decisions about the KC-10 program have undergone four complete reversals. The final defense budget of the Carter Administration terminated the program, though in March 1981, the Reagan Administration restored the original Air Force request for eight aircraft in fiscal year 1982. In September, the Administration reversed itself, cancelling the KC-10 program as part of a collection of measures designed to reduce the budget for defense purchases. The Congress chose to override the Administration proposal, however, purchasing four of the tankers in fiscal year 1982 and thereby keeping the program alive at least through 1983. 5/

5/ To date, the Congress has authorized purchase of 16 KC-10s. The contract with McDonnell-Douglas provides favorable discounts for up to 44 more aircraft, though it remains in force only through 1983. The Administration's announcement to purchase additional KC-10s did not discuss the precise contractual arrangement, though it did presume some discounts.

Coming back to the Congress' most recent stance, the Administration has again turned its interest toward the KC-10--this time, however, as a component of an airlift enhancement program announced with the fiscal year 1983 budget request. The Administration intends to purchase 44 more KC-10s over the next five years, bringing the total inventory to 60 aircraft. Though the KC-10 has substantial cargo capabilities and is being proposed primarily as a cargo transport, this study evaluates its tanker features in the context of alternative modernization approaches.

KEY CHOICES BEFORE THE CONGRESS

The 97th Congress is facing fundamental decisions that will determine tanker requirements and resources through the remainder of this century. The three tanker modernization proposals noted above have been put forth for different reasons. Nonetheless, in combination, they become competitors, as DoD seeks to meet expanded tanker requirements in coming years.

In choosing among these alternatives, the Congress must consider what tanker capacity the Air Force will need in the future and what mix of the choices possible might best meet various levels of demand. To provide a background for evaluating the three tanker alternatives' performance in both strategic nuclear and conventional non-nuclear missions, Chapter II of this study outlines the tanker needs for the evolving fleet of strategic bombers, as well as for an important representative conventional mission, over the next dozen years. Chapter III notes the relative effectiveness of the tanker alternatives and suggests three alternative investment strategies for meeting future demand for aircraft.

AIRCRAFT

Advanced Technology Bomber (ATB): A new bomber being developed by the Air Force that would incorporate the latest in design and materials technology to minimize chances of radar detection.

B-1B: An updated form of the B-1 bomber, the new B-1B will have better payload and range characteristics than its predecessor and reduced visibility to radar detection. It will be able to carry cruise missiles as well as short-range weapons.

B-52D,G,H: The mainstay bombers of the Strategic Air Command, the B-52s were last delivered in the 1960s. Though updated through the years with new components, the aircraft fleet currently averages nearly 25 years of use. The Administration intends to continue modification plans to fit G and H model aircraft with cruise missiles during the 1980s. The earliest model--the D--will be retired during the next two years.

C-5/C-141: Long-range military transport aircraft capable of airborne refueling.

KC-10: The military designation for a modified form of the commercial McDonnell-Douglas DC-10 transport. The KC-10 is fitted with equipment so it can function either as a cargo transport or as a tanker for aerial refueling.

KC-135A: The Air Force's primary tanker, the KC-135A is a prototype of the commercial Boeing 707. It was first introduced in 1957 to provide aerial refueling for the Strategic Air Command's B-52 bombers.

KC-135E: The military designation for the KC-135 tanker aircraft fitted with JT3D engines.

KC-135R: The military designation for the KC-135 tanker aircraft fitted with CFM-56 engines.

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GLOSSARY (continued)

ENGINES

CFM-56: A new generation turbofan jet engine currently being manufactured jointly by General Electric and Snecma, a French firm. The engine, in addition to being used on several new types of aircraft, is being installed as a replacement engine on the commercial DC-8 aircraft. The Air Force plans to install this engine on 300 KC-135A tankers over the next five years.

JT3D: The letter designation of an engine manufactured in the past by Pratt and Whitney. The JT3D was a mainstay engine on the first generation of commercial jet transports. Its military counterpart--the TF-33--is installed on a large number of military aircraft. The Air Force is currently salvaging and refurbishing JT3D engines from some 28 retired Boeing 707s and installing them on KC-135A tankers.

Turbofan Engines: Modern jet engines of which substantial improved efficiency is achieved by having the engine turn very large fans mounted at the front of the engine.

OTHER TERMS

Forward Staging Areas: Bases near the likely area of combat used to manage combat operations of participating forces.

"Penetration" Missions: A term used to describe current bomber operations that would have bombers fly over enemy territory and attack targets with short-range weapons.

"Shoot-and-Penetrate" Missions: A term used to describe bomber missions that combine use of cruise missiles launched from long distances and short-range weapons launched from bombers flying over enemy targets. The mission would typically involve launching ("shoot") cruise missiles first; they would then enter enemy airspace ("penetrate") to launch short-range weapons.

"Stand-off" Missions: A term used to describe bomber operations that involve cruise missiles only; the bomber need not fly over enemy territory but must launch long-range cruise missiles from "stand-off" distances.

CHAPTER II. TANKER DEMAND FOR FUTURE STRATEGIC NUCLEAR AND CONVENTIONAL NON-NUCLEAR MISSIONS

Bomber modernization programs recently announced by the Administration significantly affect the Air Force's tanker needs over the next dozen years. The analysis in this chapter indicates that in the near term--that is, during the mid-1980s--the Air Force faces a substantial shortage of tanker capacity. 1/ In the long term, however, existing tanker capacity will likely prove sufficient. This chapter first discusses the estimated tanker demand over the coming 14 years in light of the recent decisions about bombers. It then examines requisite needs for possible conventional missions. Figure 1 depicts the pattern of projected tanker demand to 1995 as it relates to the current capacity of KC-135A tankers, displaying yearly cumulative demand in terms of existing, or "A", equivalents. Demand estimates above the "current capacity" line on the figure represent projected tanker shortages. Table 1 presents current and projected tanker demand for several critical years.

STRATEGIC TANKER MISSIONS

The Strategic Air Command is responsible for developing a war plan for the 375 bombers and 600-plus tankers devoted to strategic nuclear missions. Called the Single Integrated Operational Plan (SIOP), the SAC plan consists of highly detailed sets of instructions for each aircraft (as well as for land- and sea-based missiles), specifying targets, attack routes, back-up alternate plans, and so forth. The SIOP is not available for public discussion for reasons of national security; as a

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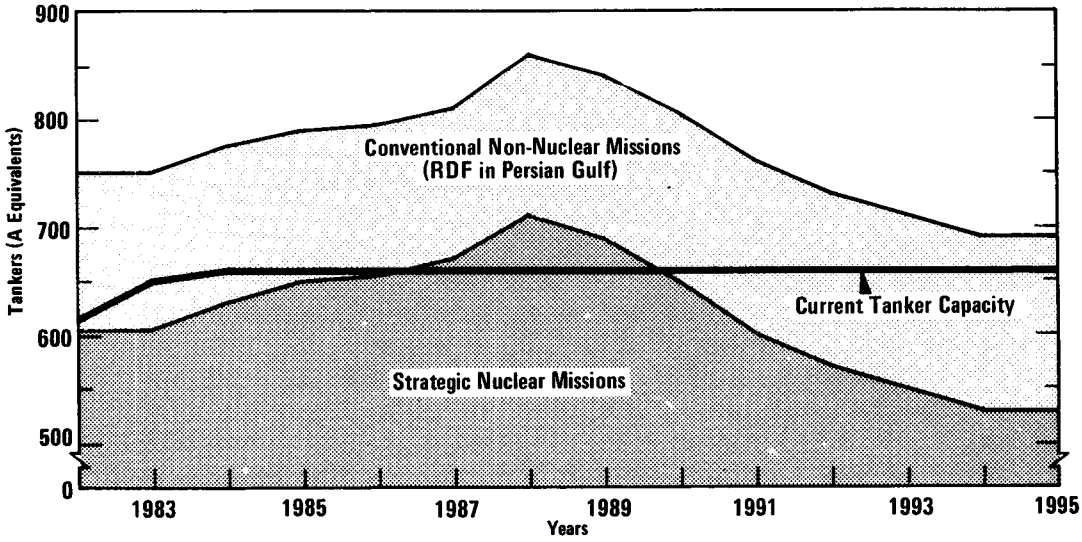
1/ The Congressional Budget Office has developed a quite elaborate technique for evaluating likely future tanker demand. Using computers to "fly" aircraft missions, aerial refueling operations were assessed in both strategic nuclear and conventional non-nuclear missions. Details about the scenarios and CBO computer model used as the basis for this study are given in Appendix A. Further technical details are available from CBO.

Figure 1.
Projected U.S. Tanker Aircraft Demand for Strategic Nuclear and Conventional Non-Nuclear Missions, 1982-1995



SOURCE: Congressional Budget Office.

substitute, a generalized hypothetical attack plan developed by CBO and composed of four generic missions served as the basis for this analysis. (Further discussion is provided in Appendix A.) They are depicted in Figure 2. Bombers were assigned to each mission on the basis of industrial concentration and military installations in Soviet territory.

Bomber Modernization Plans

The Administration recently announced plans to build two new bombers: an updated version of the B-1, to be fielded in the mid-1980s, and an advanced technology bomber incorporating "stealth" technologies, to be fielded in the early 1990s. With the introduction of these two new aircraft, B-52s will gradually be retired from service. In the interim, B-52s will also be modified to carry cruise missiles, continuing the modification plans developed after 1977, when President Carter cancelled production of the B-1 in favor of cruise missiles on the B-52s. The first squadron of B-52G aircraft will stand alert with cruise missiles in December 1982. As noted in the first chapter, that modification program is to proceed in two phases.

TABLE 1. TANKER DEMAND IN 1988 AND 1994 AS MEASURED IN KC-135A AIRCRAFT EQUIVALENTS

	1983	1988	1994
Current Inventory	615	656	656
Total Projected Demand	746	860	687
Strategic Nuclear Missions a/	605 b/	713	528
Conventional Non-Nuclear Missions c/	141	147	159

SOURCE: Congressional Budget Office.

NOTE: Numbers are expressed in terms of Primary Aircraft Authorization (PAA), which slightly underestimate totals.

NOTE: The Air Force does not designate tankers for either strategic or conventional missions. The Strategic Air Command does contend, however, that the KC-10 cannot support strategic mission requirements.

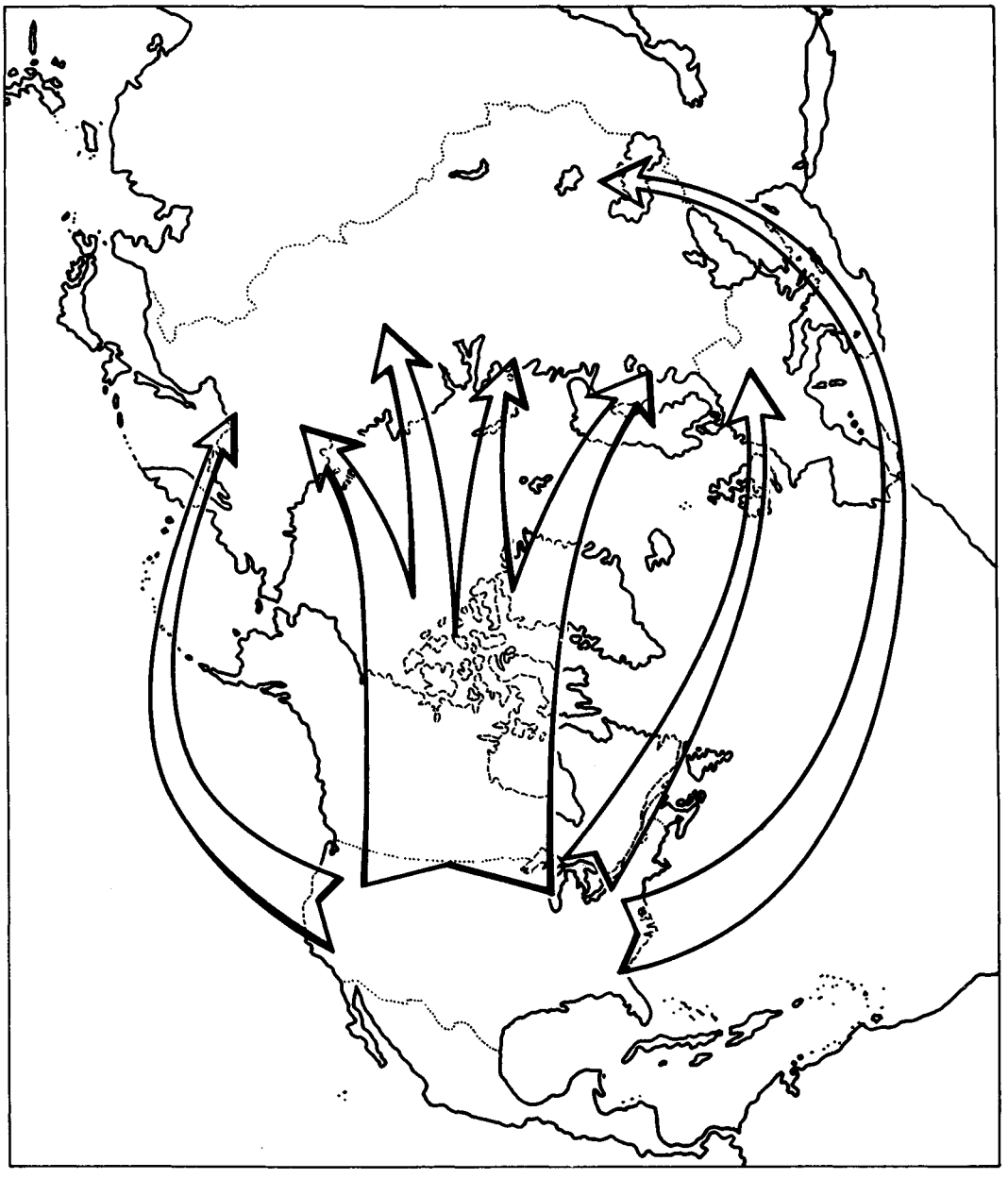
a/ Includes tanker support for command post aircraft and certain reconnaissance aircraft with assigned strategic missions.

b/ Excludes tanker support for D model B-52s which the Administration intends to retire by the end of fiscal year 1983.

c/ Assumes that the 50 C-5s requested by the Administration will be introduced starting in 1988 and will be fielded by 1990.

The first involves installation of cruise missiles on pylons under the wings, with the internal bomb bays loaded with short-range weapons. The bomber will be capable of first launching the cruise missiles before entering enemy airspace and then continuing at low altitudes to launch short-range weapons against other targets. This is often called the "shoot-and-pentrate" mission. (Currently, bombers fly only "penetration" missions with short-range weapons.)

Figure 2.
Hypothetical Attack Missions Used in CBO Analysis of Tanker Aircraft Modernization Alternatives



SOURCE: Congressional Budget Office.